

What is claimed is:

1. An optical disk recording and reproducing apparatus being operative in a read mode for controlling a laser driver to maintain a laser power at a target read level so as to read a signal from an optical disk, and being operative in a write mode for controlling the laser driver to alternate the laser power between a target write level and a target bottom level comparative with the target read level so as to write a signal at a constant density into the optical disk which is rotated at a constant angular velocity, the apparatus comprising:

    a first detector being operative in the read mode for detecting a read level of the laser power, and being operative in the write mode for detecting a bottom level of the laser power;

    a first controller being operative in the read mode for outputting a read level control signal according to a difference between the detected read level and the target read level, and being operative in the write mode for outputting a bottom level control signal according to a difference between the detected bottom level and the target bottom level;

    a second detector operative in the write mode for detecting a write level of the laser power;

    a second controller operative in the write mode for outputting a write level control signal according to a

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difference between the detected write level and the target write level; and

a third controller being operative in the read mode for providing the read level control signal to the laser driver, and being operative in the write mode for alternately providing the write level control signal and the bottom level control signal to the laser driver in accordance with the signal to be written into the optical disk, wherein

the first controller operates in a pre-write mode prior to the write mode for performing a writing operation at different linear velocities along the optical disk to sample at least first and second bottom levels of the laser power, and operates in the write mode for monitoring a linear velocity at a point of the optical disk where the signal is to be recorded and for calculating a target bottom level at the monitored linear velocity by interpolation of the sampled first and second bottom levels, thereby outputting the bottom level control signal according to a difference between the calculated target bottom level and the detected bottom level of the laser power.

2. The optical disk recording and reproducing apparatus according to claim 1, wherein

the first controller comprises a sample & hold section that samples the read level control signal immediately before the read mode is switched to the pre-write mode and that holds the sampled read level control signal

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after the read mode is switched to the pre-write mode, a calculating section that samples the first and second bottom levels detected in the pre-write mode and then calculates the target bottom level at the monitored linear velocity in the write mode by the interpolation of the first and second bottom levels sampled in the pre-write mode, and a control section that outputs the sampled and held read level control signal as a bottom level control signal in the pre-write mode, and subsequently outputs another bottom level control signal according to a difference between the detected bottom level and the target bottom level which is calculated in correspondence with the monitored linear velocity.

3. The optical disk recording and reproducing apparatus according to claim 2, wherein the calculating section calculates the target bottom level of the laser power in the write mode for each point of the optical disk according to the first and second bottom levels sampled at the pre-write mode.

4. The optical disk recording and reproducing apparatus according to claim 2, wherein

the calculating section samples the first and second bottom levels detected at different linear velocities which are set by varying a clock rate of a signal while maintaining the constant angular velocity of the optical disk.

5. The optical disk recording and reproducing apparatus according to claim 1, wherein the first controller corrects the target bottom level in accordance with the write level of the laser power detected in the write mode.

6. A method of controlling an optical recording and reproducing apparatus which is operative in a read mode for controlling a laser driver to maintain a laser power at a target read level so as to read a signal from an optical disk, and which is operative in a write mode for controlling the laser driver to alternate the laser power between a target write level and a target bottom level comparative with the target read level so as to write a signal at a constant density into the optical disk which is rotated at a constant angular velocity, the method comprising the steps of:

providing a bottom sampling period prior to a period of the write mode for sampling a bottom level associated to a linear velocity of the optical disk which locally varies while the optical disk rotates at the constant angular velocity;

performing a writing operation in the bottom sampling period at different linear velocities so as to sample at least first and second bottom levels;

monitoring a linear velocity at a point where the signal is to be recorded in the write mode;

calculating the target bottom level for the monitored linear velocity by interpolation of the sampled

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first and second bottom levels;

detecting a bottom level of the laser power in the write mode; and

outputting the bottom level control signal to control the laser driver in accordance with a difference between the detected bottom level and the calculated target bottom level.